

Friends: The Role of Peer Influence Across Adolescent Risk Behaviors

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Received March 22, 2001; accepted October 3, 2001

This longitudinal project examined peer influence across five risk behaviors: cigarette smoking, alcohol consumption, marijuana use, tobacco chewing, and sexual debut. A total of 1,969 adolescents aged 12–18 years completed two waves of data collection. Each respondent matched behavior data for at least one friend. Results found that a random same sex peer predicts a teen's risk behavior initiation; there is influence only to initiate cigarette and marijuana use; and that there is influence to initiate and stop alcohol and chewing tobacco use. This finding suggests that friends may protect adolescents from risk activities. The study has implications for understanding how peer influence, expressed as social norms, may be used in public health campaigns that target teen behavior.

KEY WORDS: adolescence; friendship; peer relations; risk behaviors.

INTRODUCTION

Adolescents encounter numerous risks in their daily lives. Publicly, peers are often blamed for the onset of risk behaviors ranging from substance use to teen pregnancy (Harris, 1998). Recent work has supported and extended this position, showing that friends play an important role in both harmful and positive activities (Berndt, 1999; Mounts and Steinberg, 1995; Urberg, 1999; Wentzel, 1999). This work implies that although teens acquire information regarding risk behaviors from parents, teachers, and the media, peers may also play a crucial role in a child's development by shaping her normative beliefs and interpretation of information regarding risk activities (Cox and Cox, 1998; Petraitis *et al.*, 1995; Sussman, 1989). In essence, peer norms help determine whether a behavior is "hip," safe, and desirable.

Longitudinal research has examined the effect of friends on risk behaviors. However, these projects have

not compared the influence process across more than two risk activities. This project addressed this research gap by conducting longitudinal network analyses of the National Longitudinal Study of Adolescent Health (AddHealth) data set to examine the role of peer influence on five risk behaviors: smoking cigarettes, drinking alcohol, using marijuana, chewing tobacco, and sexual debut.

Social Influence

Theory indicates that social influence occurs when people continually compare themselves with others to ascertain whether or not their own behavior is appropriate (Deutsch and Gerard, 1955; Festinger, 1954; French and Raven, 1959; Sherif, 1936; Tedeschi and Bonoma, 1972; Turner, 1991). A similar influence pattern appears in children as they move toward adolescence and strive to create an integrated self-image apart from their parents (Erikson, 1963). To aid with this identity formation, peer groups, outgroups, and role models provide a child with significant social comparisons (Sherif and Sherif, 1964), supplying opportunities and experiences that can not be duplicated by other socializing agents (Hartup, 1979; Mueller, 1979). Adolescents are particularly vulnerable to peer influence because they share a stressful biological event over a relatively short period of time, and these physical changes are coupled with shifting personal

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expectations and new social demands (Petersen and Spiga, 1982).

Acknowledging that adolescents are particularly susceptible to peer influence, it is important to know how the process occurs. As a foundation for better understanding peer influence mechanisms, researchers should use three criteria to study adolescent friend selection: physical proximity, age, and lifestyle similarities (Epstein, 1989). Of these three characteristics, Epstein argues that the most salient guideline for adolescents choosing peers is whether potential friends have social traits that are congruent with the teen's own identity. This is important information, because as students form new friendships ties among adolescents with shared activities are strengthened while bonds with other individuals diminish. Thus, new friends are likely to have a large effect on a teen by anchoring preexisting similarities or changing the adolescent's discrepant behavior (Epstein, 1989). This last point leads to the essence of my question: How does a friendship alter a teen's risk behavior through dyadic peer influence?

Friendship Selection and Influence

To explain how peer influence and friendship selection affect adolescent behavior, theory posits that peer pressure exists as the mutual effect of close friends and that the type of friendship determines the degree of influence (Cohen, 1983). If the relationship is homophilic with regard to a particular attitude or behavior, friendship selection anchors the individual's preexisting attitude or behavior pattern. However, if the new friend has a different attitude or behavior, so that the friendship is heterophilic, there may be attitude or behavior change via influence from one person to another.

Heterophilic selection occurs for several reasons. First, because people possess a variety of attitudes, behaviors, interests, and demographics it is nearly impossible to ensure that a friendship selection is perfectly matched. Second, even if a homophilic relationship is desired, it is not always guaranteed because of incomplete disclosure of interpersonal information during friendship selection. Third, individuals may simply form heterogeneous relationships (Cohen, 1983). For instance, rather than looking for similar people, friendships may be based on physical proximity, mutual affinity, and status differentiation when a person is attracted to a higher ranked individual (Hallinan, 1978/79). The high likelihood of friends having different behaviors and attitudes when they initially meet gives us a unique opportunity to study the influence process.

Peer Influence Research

Cross-sectional studies show correlations between adolescent perceptions of their friends' activities and their own cigarette smoking (Eiser and Stroebe, 1972; Evans *et al.*, 1988; Hirschman *et al.*, 1984), alcohol consumption (Thorliundsson and Vihjalmsson, 1991), illegal drug use (Huba and Bentler, 1980; Jenkins, 1996), and sexual behavior (Benda and DiBlasio, 1994; Reinecke *et al.*, 1997; Romer *et al.*, 1994). Longitudinal surveys have also found support for perceived subjective norms predicting children's intentions to smoke cigarettes (Brook *et al.*, 1989; Chassin *et al.*, 1986; DeVries *et al.*, 1995; Mittlemark *et al.*, 1987; Norman and Tedeschi, 1989; Rose *et al.*, 1999) and drink alcohol (Ennett and Bauman, 1991).

While these peer perception studies show associations between teen behaviors and their friends' perceived activities, a methodological issue plagues them. Correlations between a person's self-reported behavior and her perception of her friend's behavior are artificially inflated when the person projects her own actions onto the friend. For instance, correlations between normative expectations for smoking and a teen's own smoking are reduced when reports of a friend's real behavior are considered (Bauman *et al.*, 1992). This diminished association is explained by the false consensus effect (Ross *et al.*, 1977) and projection (Bauman and Ennett, 1994) that lead subjects to overestimate the prevalence of their own behaviors in others. In light of this methodological limitation, measures that obtain real friend behavior are considered more accurate estimators of social influence (Bauman and Ennett, 1996). This study used such data.

Research using cross-sectional analyses of a real friend's behavior has shown that smokers are more likely to list other smokers as members of their friendship groups (Eiser and Van Der Plicht, 1984; Hill, 1971), smokers and nonsmokers display intraclique homogeneity and interclique heterogeneity (Ennett *et al.*, 1994), and share normative smoking beliefs, including opinions concerning parental approval (Eiser *et al.*, 1991). Cross-behavior analyses show that boys who smoke cigarettes and drink alcohol are significantly more likely to have friends with similar behaviors compared to boys who dip snuff and chew tobacco (Hunter *et al.*, 1991). Although these cross-sectional studies controlled for inflated associations by using real friend measures, they could not identify influence patterns. Therefore, we must look for evidence of peer influence from longitudinal studies.

Studying selection, longitudinal research on friendship dyads reports that behavior among stable adolescent friendship pairs grows more similar for sexual intercourse (Billy and Udry, 1985) and substance use (Kandel, 1978).

Other research using a longitudinal influence framework found that a single friend influences a child's school performance (Mounts and Steinberg, 1995), predicts cigarette smoking (Urberg, 1992), and may initiate another youth into cigarette and alcohol use (Urberg *et al.*, 1997). These studies have yielded insightful information about how peer influence operates across different age groups in various settings. However, they can be enhanced by looking at the role of peer influence across a variety of behaviors in one population. This project accomplished this task.

Peer influence research has primarily concentrated on behavior initiation (Aloise-Young *et al.*, 1994; Kandel *et al.*, 1978; Urberg *et al.*, 1997). Posing an additional question, this project asked whether there is also influence to stop a behavior and whether these two influences have different strengths. To answer this query I examined whether influence from a risk-behaving friend on a teen to acquire a behavior is greater than influence to stop a behavior.

METHOD

Methodological Issues

An ongoing question for the study of social influence is how to account for selection effects, so that influence is not overestimated (Kandel, 1985). To avoid this problem researchers should control for selection in three ways (Urberg *et al.*, 1997). First, only preexisting friendships should be examined, because the selection process will have already occurred and any move toward behavioral similarity is the result of influence. Second, only a new behavior should be examined. This criterion may include either initiating or stopping an activity. Third, the analyses should use statistical (i.e. hierarchical regression) rather than sample controls to account for the variance the subject and friend have in common by first entering the participant's Time 1 (T1) behavior to predict his Time 2 (T2) behavior. This project followed these suggestions by analyzing preexisting friendships, predicting changed behaviors, and employing step regression analyses.

Survey Design

This study used the peer network data set from the National Longitudinal Study of Adolescent Health (AddHealth), which examined adolescents in grades 7–12. The peer network data is a special subsample of the Add Health project that consists of all enrolled students from 16 schools. Unlike the complete AddHealth data set, the over sampled peer network dataset is not a nationally

representative sample that can be generalized to the entire population. As a special over sample the peer network data set can be used to examine peer influence models. The peer network sample consists of two schools with a combined total enrollment exceeding 3,300 and 14 smaller schools with enrollments fewer than 3,000. One of the large schools is predominately white and is located in a midsized town. The other school is ethnically diverse and is located in a major metropolitan area. The 14 small schools have various characteristics, including rural and urban locations and public and private institutional status.

The data for the peer network sample was obtained by conducting in-home interviews with the students, during which time each adolescent nominated up to five female and five male friends. Identification numbers allowed the respondents' data to be matched with their nominated friends' behaviors providing an opportunity to test the effect of a friend's T1 behavior on the adolescent's T2 behavior. A total of 3,702 students completed a wave 1 interview (April–December 1995), of which 2,727 completed a wave 2 interview (April–August 1996).

Sample

For this basic dyadic influence analysis, the AddHealth network sample was limited to 1,969 adolescents who had wave 1 data for at least one matched same-sex friend.² The sample was 48.9% (963) male, 48.5% (954) White, 19.6% (385) Hispanic, 14.4% (284) Asian, and 11.8% (232) Black. Of the total respondents 5.8% (114) did not self-identify into these four primary ethnic groups. At Time 1, 48.9% (963) of the sample were younger adolescents (12–15 years) and 51.1% (1,006) were older adolescents (16–18 years).

Measures

The friendship nomination question asked participants to name their closest friend first, followed by their next closest friend and so on up to five friends. Using the friendship nomination question, the "friend" variable was constructed by randomly selecting one of the teen's nominated same sex friends to avoid overweighing those respondents with more than one matched friend.³ The basic behavior measures are items from the AddHealth questionnaire that were used during both interviews (Table I).

²This project is limited to studying same sex friends, because I could not obtain identification numbers for opposite gender first nominated friends owing to data release limitations.

³See Note 1 (Maxwell, 2000) for a complete discussion of this methodological approach.

Table I. Questionnaire Items Used to Create Behavior Variables

Friendship nomination questions	
Male friends	List your closest male friends. List your best male friend first, then your next best friend, and so on. Girls may include boys who are friends and boyfriends.
Female friends	List your closest female friends. List your best male friend first, then your next best friend, and so on. Boys may include girls who are friends and boyfriends.
Time 1 and Time 2 Risk Behavior Measures	
Smoking cigarettes	During the past 30 days, on how many days did you smoke cigarettes?
Drinking alcohol	During the past 12 months, on how many days did you drink alcohol?
Using marijuana	During the past 30 days, how many times did you use marijuana?
Chewing tobacco	During the past 30 days, on how many days did you use chewing tobacco (such as Red Man, Levi Garrett, or Beechnut) or snuff (such as Skoal, Skoal Bandits, or Copenhagen)?
Sexual debut	Have you ever had sexual intercourse? When we say intercourse, we mean when a male inserts his penis into a female's vagina.

By selecting these five items, I tried to use measures that tap equivalent behavior timeframes so that comparisons of the effect of social influence can be made between the different risk activities. The behavior measures were recoded into dichotomous variables, reflecting any (1) or no (0) experience with a risk behavior. It should be noted that the sexual intercourse measure had a validity problem. Of the total subjects 4.5% (88) gave inconsistent responses across time for the sexual intercourse measure. These adolescents reported being nonvirgins at wave 1 and virgins at wave 2. To correct this discrepancy the sexual debut sample was limited to the 1,881 respondents who gave logical

survey answers. However, the concern with the sexual activity measure signals a potential threat to the other behavioral measures' construct validity. Did respondents who reported quitting a substance really stop the risk behavior or did they merely give incorrect answers? Unfortunately, there is no way to determine whether this issue occurred, so I relied on the AddHealth data set's own validity checks.

There were three options to measure the friendship influence effect: counting each adolescent's friend, counting the proportion of friends who had a behavior, or selecting a random friend for each respondent. Evaluating the influence effect from a respondent's multiple friends, would have overestimated the effect for those adolescents with more than one matched friend. Therefore, this solution was not selected. The second option, estimating the proportion of friends who had a behavior, was also rejected because this approach approximates measuring group influence (Maxwell, 2000). Therefore, the last option—using a randomly selected friend—was employed to capture the influence effect. To complete this procedure a variable that represented the behavior of one randomly selected same sex peer for each respondent was constructed. The selected friend could have held any position from a first to a fifth nominated peer. The decision to randomly select one friend assumes that each peer exerts an equal amount of influence, and estimates the average effect of the friends' behaviors. Although this decision likely resulted in the analyses underestimating the level of true influence, it is a precise way to measure peer influence and is consistent with the methodology that other peer influence researchers have used (Kandel, 1978; Urberg, 1992; Urberg *et al.*, 1997).

The data from which one friend was randomly chosen to approximate a measure of peer influence is presented in Fig. 1. The graph illustrates the number of matched friends for male and female respondents. There is no significant gender difference in the number of matched Time 1 friends ($\chi^2 = 6.25$, $df = 4$, $p < 0.18$).

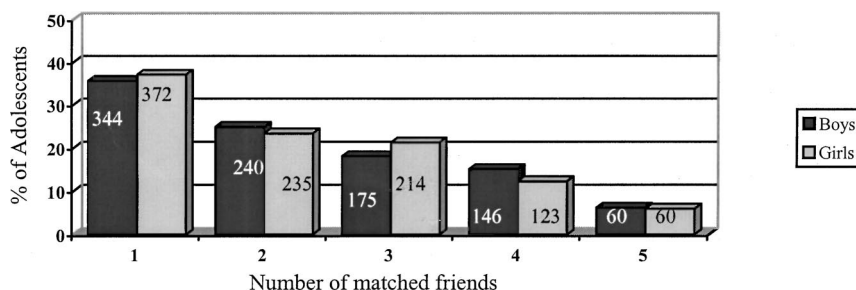
**Fig. 1.** Number of adolescents with matched behavior measures for same sex friends.

Table II. Percentage of Adolescents who Engage in a T1 Risk Behavior by Demographic Factors

Risk behavior	Age		Gender		Race			
	Young (11–15)	Old (16–18)	Male	Female	White	Black	Hispanic	Asian
Cigarettes	22.1 (796) $\chi^2 = 18.03, df = 1^{***}$	30.8 (1155)	29.9 (954)	24.8 (997) $\chi^2 = 6.39, df = 1^*$	35.5 (948)	5.2 (229) $\chi^2 = 99.05, df = 3^{***}$	22.5 (383)	21.1 (279)
Alcohol	39.1 (801) $\chi^2 = 48.83, df = 1^{***}$	55.1 (1165)	50.2 (963)	47.7 (1003)	51.6 (954)	34.5 (232) $\chi^2 = 40.88, df = 3^{***}$	56.1 (383)	39.1 (284)
Marijuana	9.6 (801) $\chi^2 = 41.06, df = 1^{***}$	20.4 (1151)	18.7 (954)	13.4 (998) $\chi^2 = 9.94, df = 1^{**}$	15.2 (948)	14.9 (228) $\chi^2 = 17.30, df = 3^{***}$	21.8 (380)	10.3 (282)
Chewing tobacco	6.4 (795) $\chi^2 = 2.76, df = 1$	8.4 (1148)	13.6 (951)	1.9 (992) $\chi^2 = 93.64, df = 1^{***}$	11.5 (946)	0.4 (230) $\chi^2 = 53.68, df = 3^{***}$	3.4 (378)	4.0 (277)
Sexual debut	16.7 (771) $\chi^2 = 153.35, df = 1^{***}$	44.0 (1099)	34.7 (902)	31.0 (968) $\chi^2 = 2.92, df = 1$	27.8 (908)	45.7 (221) $\chi^2 = 35.23, df = 3^{***}$	38.7 (362)	28.5 (267)

Note. Values in parenthesis indicate ‘n’ (number of respondents in category).
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Analysis

Each model was tested with a logistic regression using SPSS. The analysis is represented with the following equation:

$$\text{Adolescent}_{T2} = b_1\text{Adolescent}_{T1} + b_2\text{Race} + b_3\text{Gender} + b_4\text{Age}_1 + b_5\text{Friend}_{T1} + b_6\text{Adolescent}_{T1} * \text{Friend}_{T1} + a$$

The adolescent’s T1 behavior and significant demographic variables were entered in the first block to control for their influence. The friend’s behavior was entered in the second step. An interaction term representing the adolescent’s T1 behavior by the friend’s T1 behavior was entered in the third step.

RESULTS

Risk Behavior Prevalence

Univariate analyses show that risk behavior prevalence differs by activity. At the time of the first interview, 26% (497) of the respondents smoked cigarettes during the previous 30 days, 48% (900) drank alcohol during the last 12 months, 16% (293) used marijuana in the previous 30 days, 7.0% (132) chewed tobacco during the previous 30 days, and 33% (613) had sexual intercourse.

Bivariate analyses show that consistent with previous research (1996) T1 risk behavior prevalence is associated with demographic factors. Table II reports the percentages and chi-square results for this data. Age has a substantial impact on risk behavior. Older teens were more likely to smoke cigarettes, drink alcohol, use marijuana, and be sexually active than were younger teens. Boys

were more likely to smoke cigarettes, use marijuana, and chew tobacco compared to girls. The percentages show that cigarette smoking and chewing tobacco were more prevalent among the White respondents, that more than half of White and Hispanic adolescents drank alcohol, that Hispanic participants were more likely to use marijuana, and that nearly half of the Black respondents were sexually active at T1.

Bivariate analyses show that there is both uptake and reduction of risk behavior activity within the sample population (Table III). Cigarette smoking, alcohol consumption, and sexual debut show the largest changes in behavior initiation across time. Specifically, 18% of T1 nonsmokers reported smoking regularly at T2, 22% of T1 nondrinkers used alcohol by T2, and 21% of T1 virgins were sexually active at T2. Marijuana use and chewing tobacco show less behavior uptake, with only 9% of T1 marijuana

Table III. Percentage of Adolescents who Engaged in a Time 2 Risk Behavior by Their Time 1 Behavior

Risk behavior	T2 behavior	T1 behavior	
		No	Yes
Smoking	No	81.7 (1155)	22.1 (117)
	Yes	18.3 (258)	77.9 (412)
Alcohol	No	77.7 (784)	28.3 (269)
	Yes	22.3 (225)	71.7 (681)
Marijuana	No	90.6 (1473)	42.3 (126)
	Yes	9.4 (152)	57.7 (172)
Chewing tobacco	No	94.6 (1687)	47.9 (70)
	Yes	5.4 (97)	52.1 (76)
Sexual debut	No	79.0 (991)	0.0
	Yes	21.0 (263)	100.0 (610)

Note. Values in parenthesis indicate ‘n’ (number of respondents in category).

Table IV. Probability of Adolescents Having a T2 Risk Behavior Based on Their Prior Behavior and Any Friend's T1 Behavior^a

Risk behavior	Significant T1 variables	Teen had behavior T1		Random friend had T1 behavior	
		Log odds	CI	Log odds	CI
Cigarettes	Adolescent use	13.28***	10.27–17.17	11.18***	8.56–14.60
	Race: Black	0.39***	0.25–0.61	0.44***	0.28–0.68
	Hispanic	0.61**	0.45–0.83	0.66*	0.48–0.89
	Asian	0.62**	0.44–0.88	0.65**	0.46–0.92
	Friend use	—	—	1.73***	1.33–2.25
	Friend × Adolescent	—	—	2.04**	1.20–3.49
			Adj. $R^2 = 26.8$		Adj. $R^2 = 27.4$
Alcohol	Adolescent use	8.85***	7.14–10.96	8.10***	6.52–10.07
	Race: Black	0.47***	0.33–0.67	0.51**	0.36–0.73
	Hispanic	0.79	0.60–1.04	0.79	0.60–1.04
	Asian	0.93	0.68–1.26	1.00	0.74–1.37
	Friend use	—	—	1.58***	1.27–1.96
	Friend × Adolescent	—	—	1.33	0.86–2.05
			Adj. $R^2 = 23.7$		Adj. $R^2 = 24.3$
Marijuana	Adolescent use	13.41***	10.05–17.88	11.18***	8.25–15.14
	Friend use	—	—	1.81**	1.30–2.52
	Friend × Adolescent	—	—	2.05*	1.09–3.88
			Adj. $R^2 = 15.6$		Adj. $R^2 = 16.2$
Chewing tobacco	Adolescent use	12.64***	8.47–18.88	10.78***	7.13–16.31
	Gender: girls	0.17***	0.11–0.28	0.20***	0.12–0.32
	Friend use	—	—	2.14**	1.35–3.38
	Friend × Adolescent	—	—	0.72	0.28–1.87
		Adj. $R^2 = 13.5$		Adj. $R^2 = 13.9$	
Sexual debut	T1 virgin	—	—	—	—
	Age: older	2.33***	1.71–3.17	2.18***	1.60–2.98
	Race: Black	1.24	0.77–2.02	1.14	0.70–1.88
	Hispanic	1.34	0.93–1.93	1.24	0.86–1.80
	Asian	0.52**	0.33–0.83	0.52**	0.33–0.83
	Friend non-virgin	—	—	2.08***	1.60–2.98
	Friend × Adolescent	—	—	—	—
			Adj. $R^2 = 3.5$		Adj. $R^2 = 5.4$

^aEach behavior model includes significant demographic variables.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

nonusers reporting use at T2 and 5% of T1 nonchewers chewing tobacco at T2. Risk behavior reduction shows the opposite pattern of risk activity initiation.⁴ Chewing tobacco and marijuana show the largest quit rates with 48% of T1 chewers and 42% of T1 marijuana users reporting no T2 use. Comparatively, cigarette smoking and alcohol consumption display smaller declines. Only 22% of T1 smokers and 28% of T1 drinkers stopped using each substance respectively at T2.

Influence Effects of a Random Friend

The initial data observation supports the intuitive notion that an adolescent's T2 behavior is predicted by their

previous actions.⁵ Specifically, the log odds in Table IV show that teens who had engaged in a risk behavior at T1 are more likely to exhibit the same behavior at T2 than are T1 nonparticipants. Showing the greatest odds likelihood, teens are 13.4 times more likely to use marijuana at T2 if they used at T1. In comparison, showing the weakest effect among the tested behaviors, adolescents are nearly nine times more likely to consume alcohol at T2 if they drank alcohol at T1. Even though the effect from previous alcohol use is lower than the other behavior effects, it illustrates the strong tendency for adolescents to continue participating in a risk activity.

⁴It was not possible to study reduction in sexual activity, because a person cannot transition back to virginity once they have engaged in sexual intercourse.

⁵The sexual intercourse measure presented a tautology, because all T1 nonvirgins were defined as nonvirgins at T2. Since one of the four cells in Table II is empty, a stable estimate of the effects of T1 behavior on T2 behavior could not be provided by a logistic regression. For the regression analyses, only T1 virgins are included in Tables IV and V.

The next analyses asked whether any random same sex friend’s behavior predicts change in a teen’s risk behavior. This was clearly the case. The log odds show that a friend’s T1 behavior significantly predicts each adolescent’s T2 risk activity (Table IV). Peer influence is greatest for chewing tobacco (2.14) and lowest for marijuana use (1.58). Although influence varies slightly across behaviors, its effect is essentially the same. That is, teens are on average 1.9 times more likely to engage in a risk behavior at T2 if any friend had the behavior at T1 when controlling for the respondent’s prior behavior. Yet, while the peer influence effect is always significant, it is never a stronger predictor than the teen’s own behavior.

Each behavior model’s explained variance, which is measured by the pseudo-adjusted R^2 , also provides information on the random friend model’s ability to predict the teen’s T2 risk behavior. The level of variance explained for each behavior ranges from 5% for sexual debut to 27% for cigarette smoking and alcohol use. However, careful examination of the table shows that most of the variance difference reflects the respondent’s own T1 behavior, not their friends’ activities. Examination of the amount of variance added by the friend influence effects reveal that friends contribute on average only 0.8% of the variance for each respondent’s risk behavior, with a low of 0.4% for marijuana use and a high of 1.9% for sexual debut.

The last question in Table IV asks whether the influence effect from a using friend varies with the adolescent’s T1 behavior. This analysis was tested with an interaction term. There are two significant results. The influence effect from a random same sex friend who participates in a risk behavior is two times greater on T1 nonusers to begin smoking cigarettes and marijuana compared to the effect on T1 cigarette and marijuana users to continue the behavior. On the other hand, the insignificant results

for alcohol and chewing tobacco reveal that for these two behaviors the influence effects are statistically equal for behavior initiation and cessation.

The earlier analyses frame the results in terms of a friend’s participation in a risk behavior affecting the respondent’s use, showing a positive influence to engage in the risk behavior. An extension of this question is whether a friend may encourage an adolescent to stop a behavior. Thus, there are two effects to be considered: influence toward and influence away from a risk behavior. That is, is there influence to initiate or maintain a behavior or is there influence to avoid or stop a preexisting behavior? In the first case, a friend who engages in a risk activity exerts influence. In the second scenario, influence is exerted by a friend who does not engage in a harmful behavior, thereby offering a protective function. For the purposes of this analysis, influence was defined as conformity to a friend’s T1 behavior. The results are reported in Table V.

The data presented in Table V are the percentage of adolescents who display a risk behavior at T2 by their friend’s T1 behavior. The data contain two important findings. First, there are main effects for behavior initiation among T1 nonusers and behavior maintenance among T1 users. Second, the results illustrate three separate patterns for the comparisons of behavioral influence from T1 nonusing and T1 using friends: uptake, equal effects, and maintenance. The first effect, uptake, represents the outcome for cigarettes, marijuana use, and sexual debut. The cigarette and marijuana results mirror the significant interactions reported in Table IV, which show a stronger effect of a using friend on T1 nonusers compared with T1 users. Specifically, Table V demonstrates that the main effect of a smoking friend on a teen to begin using cigarettes led to twice as many respondents smoking at T2 (30%) compared to respondents whose friend did not

Table V. Conformity Displayed Through the Percent of Teens Displaying a Risk Behavior at T2 Based on the Teen’s T1 Behavior and the Influence Effect From a Using Friend

Risk behavior	Adolescent’s T1 behavior	% of adolescents who display T2 risk behavior		Conformity to friend’s T1 risk behavior (%)	Type of conformity
		No friend had behavior	Random friend had behavior		
Cigarettes	No	15 (1130)	30 (267)	15	Uptake
	Yes	76 (210)	79 (249)	3	
Alcohol	No	18 (611)	29 (398)	11	Equal
	Yes	63 (330)	75 (619)	12	
Marijuana	No	8 (1434)	19 (173)	11	Uptake
	Yes	56 (158)	61 (130)	5	
Chewing tobacco	No	5 (1653)	14 (109)	9	Maintenance
	Yes	43 (94)	71 (51)	28	
Sexual debut	No	17 (944)	33 (304)	16	Uptake

Note. Values in parenthesis indicate ‘n’ (number of respondents in category).

smoke (15%). In comparison, among T1 smokers the data show that there was only a 3% difference in the number of respondents who continued to smoke based on their friend's T1 smoking status. I consider this small difference a noneffect. A similar pattern appears with marijuana use. The new marijuana use rate is twice as high among T1 nonusers who had a T1 marijuana using friend (19%) compared to those whose friends did not use marijuana (8%). Looking at the data for T1 marijuana users reveals that a using friend had a negligible effect (5%) on maintaining a teen's marijuana use (61%) when contrasted with teens whose friends did not smoke marijuana (56%). Sexual debut also demonstrates the uptake pattern. 33% of T1 virgins whose friend was sexually active at T1 became sexually active at T2 compared to 17% who remained virgins at T2. In comparison to the uptake model, alcohol use shows an equal conformity level between T1 nondrinkers and drinkers. There is only a 1% difference in the conformity effect experienced by T1 drinkers and nondrinkers. That is, compared to students whose friend did not drink at T1, there were 11% more respondents who began drinking and 12% more students who continued drinking if their friend used alcohol at T1. Finally, chewing tobacco illustrates the maintenance pattern. The influence effect from a chewing friend was much greater on a T1 using teen to continue chewing (28%) compared to the effect of a chewing friend on a T1 non-chewer to begin chewing (9%). These various outcomes show that there is no single consistent pattern for the effect of peer influence across behaviors. The percentages also reveal that not only do using friends encourage a teen to begin and maintain a behavior, but nonusing friends may encourage a teen to stop or avoid a behavior.

DISCUSSION

This study examined the influence of a single friend on a variety of teen risk behaviors: smoking cigarettes, chewing tobacco, consuming alcohol, using marijuana, and sexual debut. By using longitudinal data, this project tested whether social influence follows a consistent pattern across activities and conditions. Selection, the process by which friends choose each other based on preexisting similarities, poses a threat to many influence studies. This project employed a methodology that controls for selection by using longitudinal data to study behavior changes between friends with dissimilar behavior patterns at time one. Of course, it is likely that selection and peer influence processes occur simultaneously. Nonetheless, this study operates under the assumption that social influence is a viable and quantifiable force.

This study has two main findings. The first result shows that a random same sex friend influences an adolescent to change his or her risk activity level. After controlling for the adolescent's own T1 behavior, a respondent is on average 1.9 times more likely to exhibit a risk behavior at T2 if their friend reported the same behavior at T1. Influence from a friend was roughly equal for each risk behavior. While the data show that teens are generally twice as likely to engage in a risk activity if their friend had participated in the behavior at T1, the explained variance that a random friend contributes to the peer influence model is minimal—on average 0.86%. At a first glance, this small increase in explained variance provided by a random friend's influence may call into question the impact of peer influence in explaining adolescent risk behavior. However, two factors underscore the importance of influence. First, adolescents are likely to have unstable relationships that may diminish the influence effect and explain the low variance attributed by a random friend. Second, when we look at the actual percentage change in behavior prevalence the data show that on average risk behavior initiation is 12% greater for respondent's whose friends participated in an activity at T1. These numbers show that friends are having a strong effect on adolescent risk behavior, despite the low variance that they contribute to the model.

The second finding reveals that for two behaviors a friend's influence effect varies by the adolescent's Time 1 behavior. That is, the influence effect from a using friend is greater on T1 nonusers to smoke cigarettes and marijuana than it is on T1 users to maintain their cigarette and marijuana smoking behavior. This finding mirrors other work which found peer group influence for cigarette smoking initiation, not quitting (Ennett and Bauman, 1994). On the other hand, the analyses reveal that for alcohol and chewing tobacco use influence occurs equally in two directions—to begin or maintain and to avoid or stop the behavior, depending on the adolescent's T1 risk behavior status. This finding suggests that peers may offer teens protection from some risk behaviors.

I argue that the varying role of peer influence across behaviors depends upon the activities' characteristics. Although it would be easy to argue that a behavior's chemical dependency properties alter the role of influence in risk behavior participation, this project has conflicting results for two addictive tobacco products—cigarette smoking and chewing tobacco—as noted above. Therefore, I suggest that the behavior's social context plays an important role in risk behavior prevalence. Cigarette smoking is an activity that is easily done alone when walking down the street or standing outside school. In comparison, drinking alcohol and chewing tobacco are more social, group based

activities whose prevalence may be affected by larger group norms. Alcohol is often used at parties and tobacco chewing is associated with team sports. Therefore, if friends do not engage in these activities teens may be less likely to do them as these results suggest.

Research Limitations

This project's generalizability is limited by several factors. First, the analyses only examined influence from same sex friends. Even though same sex friends are the norm throughout childhood, opposite sex friendships develop in adolescence and take on a different quality (Savin-Williams and Brendt, 1990). These new relationships often entail large mixed gender social gatherings and initial romantic relationships. Therefore, this analysis may be missing an important aspect of peer influence. Future research should examine the impact of cross-gender friend's influence on a teen's behavior. Second, is the variance in the time periods measured across the behaviors. The cigarette, marijuana, and chewing tobacco items examined use in the previous 30 days. In contrast, the alcohol questions referenced behavior within the last 12 months. Also, deviating from the 30-day timeframe, the Time 1 and Time 2 sexual debut questions dealt with behavior that ever occurred. Unfortunately, these time differences may have affected the comparison across behaviors. Future studies should make an effort to examine behaviors that have a consistent time frame for more accurate cross-behavior analyses. Third, the study only examined dichotomous behavior measures. A useful next step would be to study different levels of risk behaviors (i.e., none/some/a lot) or actual quantity. Fourth, the study did not examine the influence from parents. A useful area for future research may be to include the affect that parents, siblings, teachers, and other caregivers have on the adolescent in order to test a complete model of socialization theory (Vandell, 2000).

Intervention Implications

This study's most relevant finding is that the influence effect from a random same sex friend varies by behavior. That is, for alcohol and chewing tobacco use, a friend may encourage a teen to either begin or stop a behavior. In comparison, for cigarette and marijuana use the influence effect is substantially greater for Time 1 nonusers to uptake the behavior than for Time 1 users to stop the activity. These differing results suggest that dyadic influence should not be operationalised as a single, consistent effect on adolescent risk behaviors. This has important implications for designing campaigns to reduce risk activities. The varying effects of behavioral influence also suggest

that future studies should continue to examine how peer influence both encourages and discourages a multitude of behaviors in a single population. This may include not only harmful activities studied here, but also positive actions including school performance. Such research will broaden our understanding of the social pressure teens experience, while preventing us from being misled by studies which examine peer influence in only one behavior. Specifically, these findings may support an intervention based on altering adolescent perceptions of wider social norms. Doing so may increase the positive effects of friends who do not engage in risk activities, as is the apparent case with chewing tobacco. If teens believe that a risk behavior's prevalence is low, nonusing friends' attitudes and behaviors may be seen as more legitimate and therefore be more persuasive. A similar technique has already proven successful with interventions to increase condom use and reduce violence among teens (Stanton *et al.*, 1996, 1997).

In conclusion, this study found that a random same sex friend may influence a teen's risk behavior initiation. It also reveals that for some behaviors the influence effect is equally strong for risk reduction. Therefore, we must examine how friends not only encourage risk behaviors but also reduce them. It is essential that researchers look not only at the negative outcomes of peer influence, but also at the positive, to understand how we may prevent adolescent behavior which may have long-term negative consequences on this generation's future.

ACKNOWLEDGMENTS

This article was partially funded by NIH grant 1-RO3-MH-61643-01 to the author. The AddHealth research is based on data from the AddHealth project, a program project designed by J. Richard Udry (PI) and Peter Bearman, and funded by grant P01-HD31921 from the National Institute of Child Health and Human Development to the Carolina Population Center, University of North Carolina at Chapel Hill, with cooperative funding participation by the National Cancer Institute; the National Institute of Alcohol Abuse and Alcoholism; the National Institute on Deafness and Other Communication Disorders; the National Institute of Drug Abuse; the National Institute of General Medical Sciences; the National Institute of Mental Health; The National Institute of Nursing Research; the Office of AIDS Research, NIH; the Office of Research on Women's Health, NIH; the Office of Population Affairs, DHHS; the National Center for Health Statistics, Centers for Disease Control and Prevention, DHHS, the Office of the Assistant Secretary for Planning and Evaluation, DHHS; and the National Science Foundation. Persons interested in obtaining data files from

the National Longitudinal Study of Adolescent Health should contact Jo Jones, Carolina Population Center, 123 West Franklin Street, Chapel Hill, NC 27516-3997 (email: jo_jones@unc.edu).

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